Course: Nutritional Biochemistry and Physiology

1. Type : Specialization's Elective

:

- **2. Code** : PTN 6104
- **3. Credit** : 2/0
- **4. Semester** : Odd
- 5. Description

The life of animal is determined by the physiology of digestion activities, absorption, and metabolism of biological compounds in cells. Just like carbohydrates, proteins, lipids and nucleic acids, in which, the process is carried out enzymatically. To understand the biological process in every animal science study, we need to observe the logical life studies that are always related to physiological and biochemistry activities. Based on the above things, animal science students need to understand the formulation of feed and water intake, especially for ruminants and non-ruminant animals, physiology of digestion (poultry, ruminants and non-ruminants), dynamics of digestion and absorption of nutrients. Furthermore, there will be a discussion for metabolism of carbohydrates, proteins, lipids and nucleic acids on ruminants and non-ruminants, and their interaction during energy production process. The discussion will also talk about structures and kinetics of enzyme, abnormalities and metabolism setting, physiological system that includes hormonal, immune system and nerves, as well as the detoxification process.

6. Course Outcomes (CO)

- CO 1 : Students understand and are capable in explaining physiological and biochemical functions of livestock digestive organs as well as its influencing factors.
- CO 2 : Students understand and are capable in explaining biochemical and physiological activities of ruminal microbes.
- CO 3 : Student understand and are capable to explain metabolism process of biological compounds and its connection one to another, as well as it rules.
- CO 4 : Students understand and are capable to explain the link between intra and extra cellular of cell metabolites in various organs and their effects on anima production and reproductive performance.

								E	LO*	*							
CO*	А			В			С			D							
	1	2	3	4	1	2	3	1	2	3	4	1	2	3	4	5	6
CO 1				\checkmark	\checkmark	\checkmark											
CO 2				\checkmark				\checkmark			\checkmark			\checkmark			

7. The Alignment Between CO and ELO

CO 3		\checkmark							\checkmark
CO 4									

*CO refers to point 6.

**Expected Learning Outcomes (ELO) are written below,

A. Attitudes and Behaviors

The graduates are able to behave well, correctly, and culturally as the result of internalization and actualization of values and norms, which is reflected in a spiritual and social life through learning process, experience, research, and/or community development in the animal husbandry.

1	Piety to God and be able to show religious attitude and maintain the humanity values in carrying the
-	task, which is based on religion, moral, and ethics.
2	Be proud and love the homeland show nationalism, and contribute to the improvement of the life
	quality in the community, nation and country, and the advancement of civilization according to
	Pancasila.
3	Showing the social sensitivity and attention to the community and environment by respecting the
	culture diversity, view, religious, beliefs, and other people's opinion, and also obey the rules.
4	Be accountable in carrying the professional practice that includes ability to accept accountability
	towards decision and professional action. It shall be according to the scope of the practice under
	their responsibility and laws.

B. Mastery in Sciences

Master the theory of the current science in the animal husbandry and its application.

1	Able to master the current animal science and its application theory.
---	---

2	Able to master the livestock production science, animal nutrition and fed science, animal products technology, and the livestock social economics in relation to food security and environment.
	Able to meeter the lines to all and deption or investment metrician and find existing a second second

3 Able to master the design, management, and development of livestock research.

C. Special Skills

The graduates are able to develop science, technology, and arts in the animal husbandry through interdisciplinary/multidisciplinary innovative and tested research.

1	Able to make innovation in the animal husbandry based on the development of science and
	technology.

- 2 Able to design interdisciplinary and multidisciplinary research in the animal husbandry.
- 3 Able to formulate and solve problems in the national development especially in terms of animal husbandry.
- 4 Able to solve problems and anticipate issues in the development of animal science and industry.

D. General Skills

The graduates are able to manage resources by utilizing science, technology, and arts to solve problems in the animal husbandry with current science and also conduct research with accountability and full responsibility.

1	Able to develop logical, critical, systematic, and creative thought through scientific research, creation of design in the science and technology, which pays attention and applies humanity values according to their expertise. The graduates are able to arrange scientific concept and the study result based on the principles, procedures, and scientific ethics.
2	Able to identify the science that becomes their research object and position it to a research map by using information technology in the context of science development and expertise implementation developed through interdisciplinary or multidisciplinary approaches.
3	Able to make a decision in the context of solving problems in the development of science and technology, which pays attention and applies humanity values based on analysis study or experiment towards information and data.
4	Able to communicate the result of reasoning and scientific research in form of thesis and scientific writing responsibly based on academic ethics in the accredited national journal.
5	Able to maintain the academic integrity generally and avoid the plagiarism practice.

6 Able to communicate spoken and written English effectively by using the information technology for the development of animal science and its implementation.

8. Course Content

Week	CO	Tania/Subtania	Learning	Assessment	Allocated	Lastuman
vv eek	CO	Topic/Subtopic	Activity	Tools	Time	Lecturer
	CO 1	Physiological	Classical	Midterm	2	
1		aspects of poultry	lecture and			
1		and non-ruminant	discussion			
		digestive system				
	CO 1	Nutrient intake	Classical	Midterm	2	
2		dynamics on	lecture and			
2		poultry and non-	discussion			
		ruminant				
	CO 1	Nutrient	Classical	Midterm	2	
2		absorption	lecture and			
5		dynamics on	discussion			
		poultry				
	CO 1	Physiology and	Classical	Midterm	2	
4		development of	lecture and			
4		digestive system	discussion			
		on ruminant				
	CO 1	Intake-nutrient	Classical	Midterm	2	
5		dynamic on	lecture and			
		ruminant	discussion			
	CO 1	Calf nutrient and	Classical	Midterm	2	
6		factor affecting	lecture and			
0		rumen	discussion			
		development				
	CO 1	Feed-particle size	Classical	Midterm	2	
		and its effects on	lecture and			
		feed intake,	discussion			
7		ruminal				
		fermentation, and				
		ruminal papillae				
		development				
		Mid	term Examinat	ion		
	CO 1	Forage and its	Classical	Final exam	2	
8		effects on ruminal	lecture and			
		microbes	discussion			
		development				

	CO 2	Ruminal microbes	Classical	Final exam	2	
9		physiology	lecture and			
			discussion			
	CO 2	Metabolism of	Classical	Final exam	2	
10		ruminal microbes	lecture and			
			discussion			
	CO 3	Metabolism on	Classical	Final exam	2	
11		various organs	lecture and			
			discussion			
	CO 3	Nutrient and	Classical	Final exam	2	
		hormone and its	lecture and			
12		roles on digestive	discussion			
		and metabolism				
		regulation				
	CO 4	Nutrient and	Classical	Final exam	2	
13		immunity	lecture and			
			discussion			
	CO 4	Metabolic	Classical	Final exam	2	
		adaptation and	lecture and			
14		hormonal system	discussion			
		during				
		reproductive cycle				
		Fi	nal Examinatio	n		

9. Assessment

Component	CO	Percentage (%) for	Minimum
Component		final grade	Satisfactory Level
Class participating	CO 1; CO 2; CO 3	10	
	CO 4		
Discussion	CO 1; CO 2; CO 3;	10	
	CO 4		
Midterm	CO 1	35	
Final exam	CO 2; CO 3; CO 4	35	
Το	otal	100	

10. Lecturer

^{1.} Team

11. Reference